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| EXAMINER |
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VOLPER, THOMAS E

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| ART UNIT | PAPER NUMBER |
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2665

DATE MAILED: 12/16/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/631,941

Applicant(s)

LYU, DUG IN

Examiner

Thomas Volper

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s) ____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5 6) ☐ Other: ____

DETAILED ACTION

Claim Objections

1. Claims 1-12 are objected to because of the following informalities:

- Claims 1 and 3 recite the limitation “differently deciding each transmission starting point of the each physical channel, if the non-orthogonality is not exist” in lines 6-7. In addition to being grammatically incorrect, this statement appears to contradict the intention of the invention as disclosed in the specification: “the non-orthogonal physical channels transmit the chip signal with different starting points of chip transmission,” (page 16, lines 3-4 of the specification).

- Claim 2 also recites a limitation contradictory to the invention as disclosed in the specification. The specification discloses “the physical channels, which use the same scrambling code and have orthogonality ... transmit the chip signal with the same starting point,” (page 16, lines 5-7), however, claim 2 appears to be reciting a limitation opposite the intention of the specification.

- Claims 1-12 appear to be a translation from a foreign document and contain many grammatical errors. The applicant is advised to find and correct such errors.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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3. Claims 7 and 8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. The term "relatively" in claim 7 is a relative term which renders the claim indefinite. The term "shorter" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-4 and 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ovesjo et al. (US 6,542,484) in view of McDonough et al. (US 6,519,237) and Zehavi et al. (US 6,044,074).

Regarding claims 1-4 and 11, Ovesjo discloses using different non-orthogonal scrambling codes for downlink communication from a base station to mobile stations in different sectors of a cell (col. 7, line 1 – col. 8, line 46; see also Figures 7a-7c). All users within a particular code set use the same scrambling code, and thus are orthogonal to each other. However, the users in one code set are non-orthogonal to users in an adjacent code set. Ovesjo fails to expressly disclose that each non-orthogonal physical channel has a different starting

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point. McDonough discloses shifting the starting points of pseudonoise (PN) sequence in the downlink signal of several base stations (col. 2, line 66 – col. 3, line 14; see also Figure 1b). McDonough does not explicitly disclose shifting the starting points of scrambling codes, however, Zehavi et al. discloses that PN spreading codes are typically shared by all communication signals in a cell, beam, or sub-beam (col. 2, lines 16-29). In this functionality described by Zehavi, it is clear that PN spreading codes are being used as scrambling codes, according to the definition of scrambling codes set forth in the present invention. McDonough, in light of Zehavi, discloses the possibility of shifting the starting points of scrambling codes. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to offset the scrambling codes of different code sets in the invention of Ovesjo so that the non-orthogonal scrambling codes would have different starting points. One of ordinary skill in the art would have been motivated to do this to further reduce interference between code sets.

Regarding claim 10, Ovesjo fails to expressly disclose different starting points for each scrambling code wherein the time interval between each of the starting points is a reciprocal of the number of scrambling codes. McDonough discloses a circular diagram of PN code phase shifts that shows 512 possible phase shifts (see Figure 1a). The phase shifts between each PN code starting point is 64 bits, thus the phase shifts are equally spaced (col. 2, lines 13-33). Since the shifts are equally spaced in the circular diagram, the time interval of a phase shift must be equal to the reciprocal of the number of phase shifts representing different scrambling codes. At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to equally space phase shifts in time for each of the scrambling codes used in the invention of

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Ovesjo. One of ordinary skill in the art would have been motivated to do this so as to reduce interference among scrambling codes evenly within the cell.

Regarding claim 12, McDonough discloses that in a system using PN code phase shifts, a mobile station checks all phase shifts and attempts to correlate them to a received input signal (col. 2, lines 34-54).

7. Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ovesjo et al. (US 6,542,484) in view of McDonough et al. (US 6,519,237) and Zehavi et al. (US 6,044,074) as applied to claims 1-4 and 10-12 above, and further in view of Teidemann, Jr. et al. (US 5,509,035).

Regarding claim 5, the teaching provided by Ovesjo et al. in view of McDonough et al. and Zehavi et al. fails to expressly disclose that a value for the PN code shifts are chosen to minimize mutual interference. Teidemann discloses that PN code phase offsets are designated to allow a base station to communicate with a mobile station with minimal interference (col. 5, lines 58-67). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to designate PN code offsets that created minimal interference among the non-orthogonal users in the system provided by Ovesjo et al. in view of McDonough et al. and Zehavi et al. One of ordinary skill in the art would have been motivated to do this in order to create a more efficient communication system.

Regarding claim 6, Ovesjo discloses that a cell may contain different numbers of code sets, each using different scrambling codes (see Figures 7a and 7b). It is well known in the art that the base station must transmit each scrambling code with greater power with respect to

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Figure 7a, than in Figure 7b. Since the base station transmits only two different scrambling codes in 7a, each corresponding to half the cell area, as compared to three scrambling codes in Figure 7b, each corresponding to a third of the cell area, more power must be designated for each scrambling code in Figure 7a to cover the greater amount of cell area, as compared to Figure 7b. In addition, McDonough et al. provides for equal spacing of the phase shift intervals (see Figure 1a). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to use equally spaced phase shift intervals, thus directly relating greater cell power per scrambling code to greater phase shift intervals between phases of different scrambling codes. One of ordinary skill in the art would have been motivated to contribute the use of the equal spacing of McDonough to system provided by Ovesjo et al. in view of McDonough et al. and Zehavi et al. thus far in order to reduce interference among scrambling codes evenly within the cell.

8. Claims 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ovesjo et al. (US 6,542,484) in view of McDonough et al. (US 6,519,237) and Zehavi et al. (US 6,044,074) as applied to claims 1-4 and 10-12 above, and further in view of O (US 6,061,338).

Regarding claims 7 and 9, the system provided by Ovesjo et al. in view of McDonough et al. and Zehavi et al. fails to expressly disclose that the time interval of a phase shift corresponds to half a chip duration. O discloses a CDMA system in which a spread code generator may shift the phase of a spread code by half a chip (col. 6, lines 21-34). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to designate the phase shift of the scrambling codes in the system provided by Ovesjo et al. in view of McDonough et

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al. and Zehavi et al. to be half a chip duration. One of ordinary skill in the art would have been motivated to do this to quickly correlate a mobile station to the proper scrambling code.

Regarding claim 8, it is an inherent property of the chip speed that the chip duration, or period, is a reciprocal of the chip speed.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Wang et al. (US 6,501,788) Apparatus and Methods for Interference Cancellation in Spread Spectrum Communications Systems

- Ostberg et al. (US 6,504,830) Method, Apparatus, and System for Fast Base Synchronization and Sector Identification

- Dahlman et al. (US 6,339,646) Slotted Mode Code Usage in a Cellular Communications System

- Sato (US 6,574,205) CDMA Cellular System and Method of Detecting Spreading Code in CDMA Cellular System

- Mennekens et al. (US 6,324,159) Method and Apparatus for Code Division Multiple Access Communication with Increased Capacity Through Self-Noise Reduction

- Dent et al. (US 5,353,352) Multiple Access Coding for Radio Communications

- Madhow et al. (US 6,175,587) Communication Device and Method for Interference Suppression in a DS-CDMA System

- Magill et al. (US 5,987,014) Multipath Resistant, Orthogonal Code-Division Multiple

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Access System

- Dent (US 6,215,762) Communication System and Method with Orthogonal Block

Encoding

- Odenwalder et al. (US 5,930,230) High Data Rate CDMA Wireless Communication

System

- De Gaudenzi et al. (US 5,327,455) Method and Device for Multiplexing Data Signals

10. Any inquiry concerning this communication, or earlier communications from the examiner should be directed to Thomas Volper whose telephone number is 703-305-8405 and fax number is 703-746-9467. The examiner can normally be reached between 8:30am and 6:00pm M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Huy Vu, can be reached at 703-308-6602. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-4750.

Thomas E. Volper

TEV

December 3, 2003



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